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(54) Odour delivery system for food products

(57) The present invention relates to a food package comprising a food product (7) and an odourant composition for aromatizing the headspace (8). The aroma composition is placed in the headspace (8) of the food product (7) and releases continuously aroma to the headspace (8) during the storage of the food package.

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Description

[0001] The present invention relates to a food package comprising a food product and an odourant composition for aromatizing the headspace.

[0002] Manufacturers of food products are interested in aromatizing their products to enhance a desirable aroma or increase the smell of freshness and to stress the uniqueness of the food product to give the customer the impression of receiving a fresh product when opening the food package.

[0003] A system for aromatizing a headspace of a food package is disclosed in EP 0 706 944. The aroma, dissolved in a liquid food-acceptable gas, is introduced under pressure into the headspace of a package containing a food product during the gas packaging of the food product. Another system for aromatizing a headspace of a food package is disclosed in EP 0 814 023. In this system a noble or inert gas such as Argon mixed with a food acceptable aroma is introduced into the headspace of a food package to impart a desirable aroma and increase the smell of freshness on opening the package. For both systems a gas packing machine is necessary to inject the aroma into the food package, which adds to process complexity and process costs. Furthermore, there may be a risk that the aroma in the headspace will be absorbed by the food product during prolonged periods of storage and almost no aroma will be present in the headspace when the package is opened by the user.

[0004] The present invention provides a system overcoming the above mentioned disadvantages.

[0005] In a first aspect the invention relates to a food package comprising a food product, and an odourant composition placed in the headspace of the package and covered by an insert, said insert defining a cavity containing said odourant composition and said cavity having outlet means to release the aroma of said odourant composition into the headspace.

[0006] The odourant composition which is placed in the headspace of the food package is in equilibrium with the aroma in the headspace. Accordingly, should any aroma in the headspace be absorbed by the food product, odourant composition continuously replenishes the headspace with aroma.

[0007] The insert containing the odourant composition is preferably fixed to the inner surface of the lid of the food package. Because a direct contact between the insert and the food product can not be avoided, e.g. during transportation, only materials that are permitted as packing materials with direct food contact should be used, for example food grade plastics, glass or metal. The insert according to the invention is made of a rigid material, preferably a material that does not interact with, or is attached or modified by, the food product. Preferred materials having the aforementioned properties are, for example polypropylene, polycarbonate, polyethylene, polyethylene terephthalate, polyvinyl chloride, and polytetrafluorethylene. Most preferred are polypropylene and polycarbonate. Typical examples are Apec (Bayer), Makrolon (Bayer), Homopolymer PP (British Petrol), or Dow PolyPropylene (Dow). These materials are stable at processing temperatures up to about 120°C, that are commonly used in the food industry for the packaging process of e.g. tomato sauce, baby food, marmalade, or pet food.

[0008] The odourant composition comprises a food-acceptable aroma which may be selected from a flavour, a fragrance, a precursor of a flavour, a precursor of a fragrance, or a mixture thereof, for example any essential oil, alcohol, aldehyde, organic acid, lactone or ketone, disclosed in E. Ziegler, H. Ziegler (Eds.), Flavourings, Wiley-WCH, Weinheim 1998, which is incorporated herein by reference. Preferably the aroma is of natural origin, for example lemon oil, grapefruit oil, or orange oil , and is preferably volatile. The aroma might be similar to that of the food product in the package, e.g. a meaty aroma for a meat product, or is different from that of the food product, e.g. fresh tomato aroma for a bolognese sauce.

[0009] In a preferred embodiment the odourant composition comprises a food-acceptable aroma and a matrix material. The matrix material according to the present invention can be any material capable of dissolving, diluting, absorbing, adsorbing and dispensing the aroma. In particular the matrix material is used for preparing an controlled release odourant composition. The matrix material is preferably solid at room temperature. Although, it is preferred to use a matrix material having a melting point above the filling process temperature to avoid mixing matrix material with the food product during the filling process, we have surprisingly found that a matrix material with a melting point from about 40°C to about 80°C adheres much better to the plastic insert and therefore emitting of the odourant composition into the food product during the storage and transportation of the food package can be avoided. In addition, the melting of the odourant composition during the packaging process results in a better release of the aroma into the headspace. For the reasons mentioned above one has to strike a balance between the favourable characteristics mentioned above and the undesirable feature of emitting matrix material to the food product. Preferably hydrophobic matrix material is used which is not soluble in food products consisting of a high amount of water. Suitable matrix materials may be selected from edible fats, waxes, natural gums, natural polymers, inorganic polymers or mixtures thereof. Typical examples are Witocan (Condea), Sett (Grünau), Beeswax Cera Flava (Kahl Waxrefinery, and Carnauba wax (Kahl Waxrefinery).

[0010] The odourant composition according to the present invention comprises up to 99.9% by weight of the matrix material, preferably from 70% to 90% by weight.

[0011] Optionally, the odourant composition compris-

es an emulsifier, for example mono- and di-glycerides of fatty acids, mono- and di-glyceride esters of fatty acids, sucrose esters of fatty acids, polyglycerine esters of fatty acids, sorbitan esters of fatty acids, and lecithin.

[0012] The odourant composition according to the present invention comprises up to 30% by weight of the emulsifier, preferably from 0.5% to 5% by weight.

[0013] Other excipients optionally present in the odourant composition may be selected from colourant and preservatives.

[0014] In another aspect, the present invention refers to a food package comprising an odourant composition placed in the headspace of the package and covered by an insert, said insert defining a cavity containing said odourant composition and said cavity having outlet means to release the aroma, and a method of making such a food package.

[0015] In another aspect, the present invention provides to a method of providing a food package comprising

dosing the odourant composition into the insert,
fixing the insert to the inner surface of the lid,
inserting a food product into a container, and
closing said container with said lid.

[0016] To further describe the invention reference is made to the accompanying drawings by way of example only and in which

Figure 1 is a cross section drawing of a food package according to the invention with the plastic insert fixed to the inner surface of the lid,
Figure 2a and 2b are cross section drawings of suitable inserts fixed to the inner surface of the lid, and
Figure 3a and 3b are cross section drawings of another embodiment of a food package according to the invention with an insert fixed to the inner surface of the lid.

[0017] Figure 1 shows a cross section of a food package consisting of a container (1) comprising a food product (7) and the insert (2) fixed with a projection portion (5) to the lid (3) defining a cavity (6) comprising the odourant composition (not shown in the drawing). The aroma of the odourant composition releases through the outlet means (4) into the headspace (8).

[0018] Figure 2a shows a cross section of the insert (2) fixed with a projection portion (5) to the inner surface of the lid (3) defining a cavity (6) comprising the odourant composition (not shown in the drawing). The outlet means (4') allowing egress of the aroma of the odourant composition. In another embodiment of the invention, as shown in Figure 2b, the outlet means (4) allowing egress of the aroma of the odourant composition are formed by fixing the projection portions (5), which are slightly raised (up to 5mm, preferable from about 0.1mm to about 2.0mm) with respect to the raised edges (9), to the inner surface of the lid (3).

[0019] Figure 3a, another embodiment of the invention, shows a cross section of a container (1) comprising the food product (7) and a cross section of the insert (2) fixed with the projection portion (5) to the lid (3') comprising the odourant composition (10). Figure 3b shows a cross section of the closed food package, filled with a heated food product after it has cooled down to ambient temperature. Because of the under-pressure in the headspace after the cooling process outlet means (4) allowing egress of the aroma of the odourant composition are formed as an result of the insert being urged away from the surface of the lid in the direction of the headspace.

Example 1: Preparation of an odourant composition

[0020] The odourant composition was prepared by melting 10g of vegetable fat (Witocan 42/44 from Condea) in a beaker on a hot plate. Six grams of a tomato aroma (Tomato Flavour 510836 E from Givaudan) was added under stirring with a magnetic stirrer.

Example 2: Evaluation of the odourant composition use in a food package

[0021] A molten odourant composition, prepared according to Example 1 was applied to a plastic insert made of polycarbonate. After cooling down until the composition became solid, the insert was fixed with a glue to the inner side of the lid (Schmalbach-Lubeca White Cap). Three jars were filled with hot (90°C) Bolognese sauce and closed with the lid. After cooling down of the closed jars to ambient temperature they were turned up-side down so that the sauce covered the insert containing the odourant composition completely. The jars were stored for 3 days in up-side down position at room temperature. Then they were turned to upright position and stored for 4 hours / 1 week /4 weeks at room temperature. For a blind test, jars were filled with Bolognese sauce as described above and closed with a lid without the insert. The jars were opened and the smell was evaluated. All panellists agreed that in all jars with the insert containing the odourant composition the aroma of the headspace of the jars significantly changed giving a fresh tomato smell compared to the meaty bolognese smell from the food product in the comparative jars without the insert.

Claims

1. A food package comprising a food product, and an odourant composition placed in the headspace of the package and covered by an insert, said insert defining a cavity containing said odourant composition and said cavity having outlet means to release the aroma of said odourant composition into the

headspace.

2. A food package according to claim 1, **characterised in that** the insert covering the odourant composition is fixed to the inner surface of the lid of the food package.

3. A food package according to claim 1 and 2 wherein the insert is made of a rigid material.

4. A food package according to claim 3 wherein the insert is made of plastic.

5. A food package according to claim 3 wherein the insert is made of polypropylene or polycarbonate.

6. A food package according to claim 1 wherein the odourant composition comprises a food-acceptable aroma.

7. A food package according to claim 6 wherein the odourant composition comprises a food-acceptable aroma of natural origin.

8. A food package according to claim 6 wherein the odourant composition comprises a flavour, a fragrance, a precursor of a flavour, a precursor of a fragrance, or a mixture thereof.

9. A food package according to claim 1 wherein the odourant composition comprises a food-acceptable aroma and a matrix material.

10. A food package according to claim 9 wherein the matrix material is selected from the group of edible fats, waxes, natural gums, natural polymers, inorganic polymers, and mixtures thereof.

11. A food package according to claim 9 wherein the odourant composition comprises up to 99.9 % by weight of the matrix material, preferably from 70% to 90% by weight.

12. A food package according to claim 9 wherein the odourant composition comprises an emulsifier.

13. A food package according to claim 12 wherein the odourant composition comprises up to 30% by weight of an emulsifier, preferably from 0.5% to 5% by weight.

14. A food package comprising an odourant composition placed in the headspace of the package and covered by an insert, said insert defining a cavity containing said odourant composition and said cavity having outlet means to release the aroma of said odourant composition into the headspace.

15. A method of providing a food package according to claim 1 comprising

dosing an odourant composition into the insert;
fixing the insert to the inner surface of the lid;
inserting a food product into a container; and
closing said container with said lid.

Fig. 1

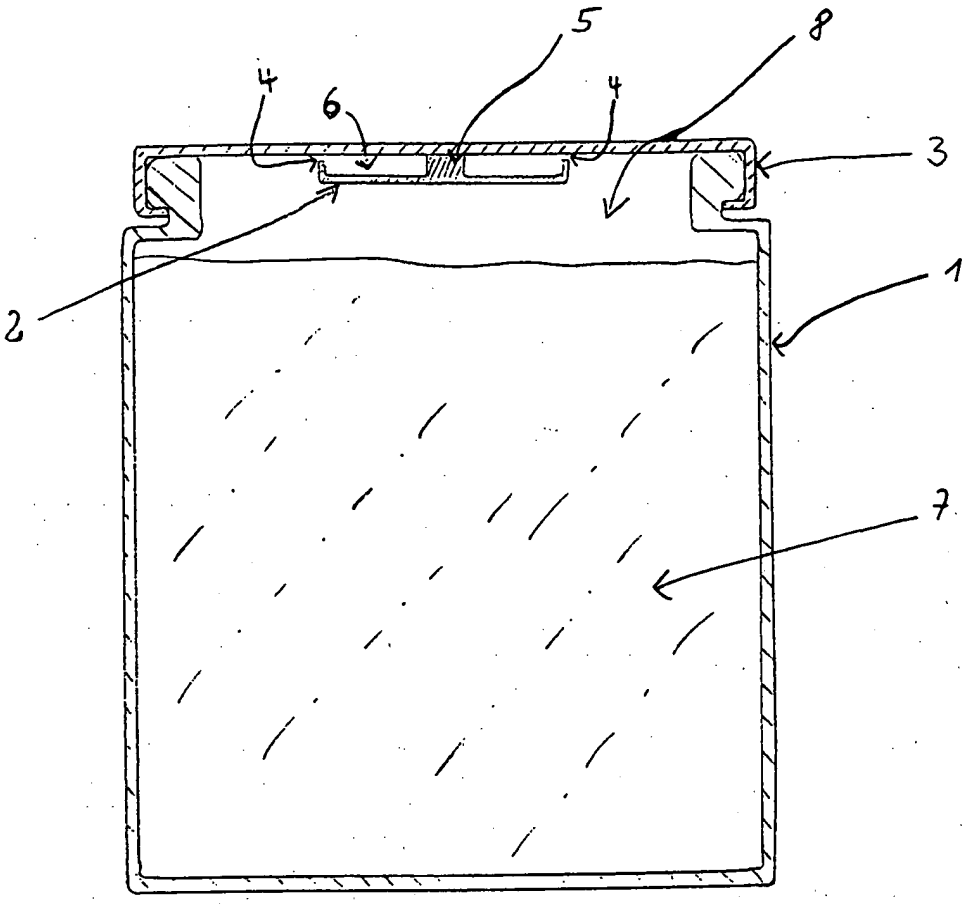


Fig. 2a

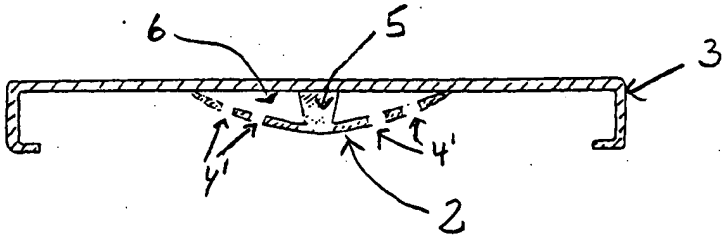


Fig. 2b

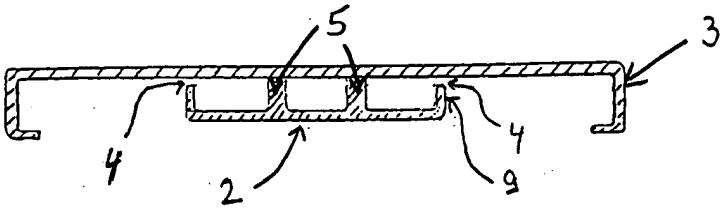


Fig. 3a

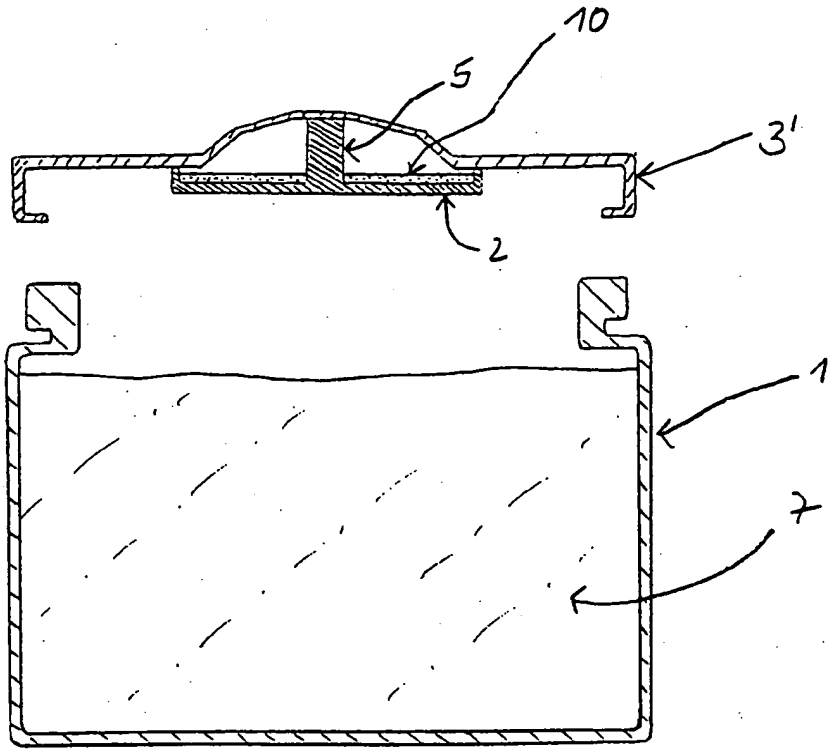
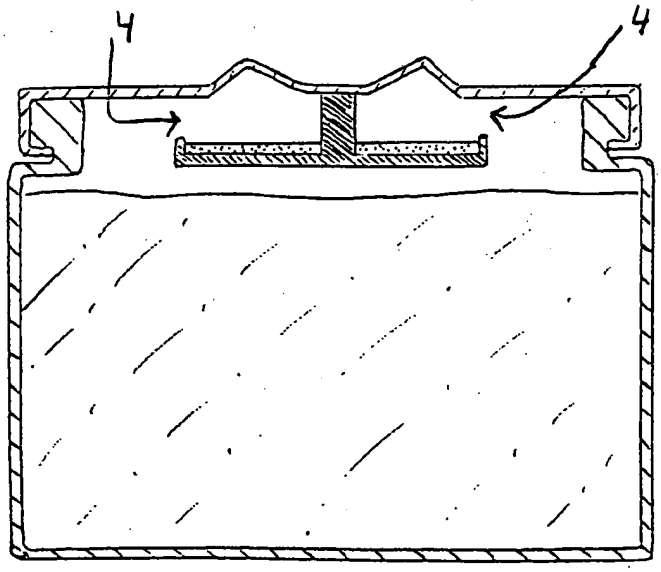


Fig. 3b



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EUROPEAN SEARCH REPORT

Application Number
EP 01 12 2984

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
BERLIN	14 March 2002	Olsson, B

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